

REMARKS

The present invention relates to a thermally expandable microcapsule that can be thermally expanded at low temperatures and which provides an expanded microcapsule that is resistant to shrinkage at high temperatures.

In the Office Action of January 11, 2007, claim 1 was rejected under 35 U.S.C. § 102(b) based on EP 1230975A1 (Masuda '975) or EP 1302239A1 (Masuda '239), with Examples 3 and 4 of each of Masuda '975 and Masuda '239 being specifically cited. Also, claim 1 was rejected under 35 U.S.C. § 112, second paragraph, with respect to the recitation "a volatile expanding agent", apparently considered as being indefinite as raising an issue with respect to antecedent basis.

In response, first, with respect to the rejection under 35 U.S.C. § 112, claim 1 has been amended to use the definite article "the" rather than "a".

Second, with respect to the acrylonitrile component in the nitrile-based monomer component, the lower limit thereof has been amended to 50% by weight. This amendment of claim 1 is supported, e.g., at page 6, line 4 of the specification, and by working Examples 1 - 7 (see Table 1 at page 10 of the specification).

As will be explained below, in view of the amendments to claim 1, it is now clear that claim 1 defines the present invention in terms which clearly distinguish over the prior art cited in the Office Action.

Novelty of Claim 1

The present inventors thought that when conventional thermally expandable microcapsules, which can be thermally expanded at low temperatures, are subjected to elevated temperatures, since the volatile expanding agents thereof escape from the shell polymer and the microcapsules are deflated, i.e., "deflations" are produced. Therefore, in order to render the volatile expanding agent resistant to escaping from the shell polymer, the present inventors developed the present invention. The present inventors have found that when, as a shell polymer, a polymer is used which contains a nitrile-based monomer component in an amount 70% by weight or more and in which a content of an acrylonitrile component in the nitrile-based monomer component is 50 to 85% by weight, is employed and as a volatile expanding agent, and a compound which contains a volatile expanding agent having a branched-chain structure or a cyclic structure in an amount 30% by weight or more, is employed, a thermally expandable microcapsule, which can be thermally expanded at low temperature and in which an expanded microcapsule is resistant to shrink at high temperatures, can be obtained.

Examples 3 and 4 of EP1230975A1 and Examples 3 and 4 of EP 1302239A1 disclose that an oil phase was prepared by mixing 150g of acrylonitrile, 100g of methacrylonitrile, 10g of

methacrylate.... The shell polymer of these prior art Examples contained a nitrile-based monomer component in an amount 96.2% by weight, and the content of acrylonitrile component in the nitrile-based monomer component was 40% by weight. These prior art thermally expandable microcapsules do not, therefore, satisfy the requirements of present claim 1. Accordingly, the rejection of under 35 U.S.C. § 102(b) as being anticipated by EP1230975A1 and EP1302239A1 should now be withdrawn.

In view of the above, reconsideration and allowance of pending claim 1 of this application is now believed to be in order, and such actions are hereby earnestly solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the local Washington, D.C. telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No.: 10/534,053

Attorney Docket No.: Q87343

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

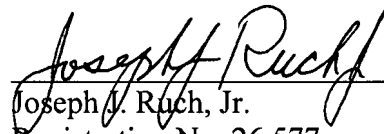
Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER


Joseph V. Ruch, Jr.
Registration No. 26,577

Date: April 11, 2007